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The Effect of Skin preparation by Using Aloe Vera Gel on Incidence of Skin Reactions among Breast Cancer Patients Undergoing Radiation Therapy

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Abstract
Background: Breast cancer is one of the most fearful illnesses for women. It accounts for nearly one of every three cancers diagnosed. Carcinoma of the breast is the most prevalent cancer among Egyptian women and constitutes 29% of National Cancer Institute cases and 33% of all female cancers; the median age is 46 years. Radiation therapy is a fundamental treatment modality for cancer. One of the most common acute side effects of radiation therapy treatment is an acute skin reaction, sometimes referred to as radio-dermatitis. This is due to damage to the rapidly dividing cells in the basal layer of the epidermis (Stratum Basal). It is suggested that up to 95% of patients treated with external beam radiation therapy will develop some form of skin reaction. The reaction's presentation will to some degree impact on the physiological, emotional and financial well-being of the patient, and can be significant enough to warrant cessation of the radiation treatment. Nursing care of patients receiving surgery, radiotherapy, chemotherapy, or biologic therapy, alone and in combination, begins with physical and psychological preparation. The vital role of the oncology nurse is assessment of skin reactions, patient education regarding skin care, prevention, and managing skin breakdown if it occurs. Studies have evaluated aloe Vera gel as one of prophylactic agents for radiation-induced skin toxicity. Showing that there are several pharmacologically active compounds presented in the aloe Vera gel may help to decrease inflammation. Aim of the study: to identify the effectiveness of skin preparation by using aloe Vera gel on the incidence of skin reactions among breast cancer patients undergoing radiation therapy. MATERIAL & METHODS: (60) adult female patients with a diagnosis of breast cancer undergoing post operative radiation therapy were randomly and alternatively divided into two equal groups; (30) for each group: Study group (I) received skin preparation by using aloe Vera gel and Control group (II) exposed to routine hospital care. A quasi experimental design was used . Tools: data was collected using a structured interviewing sheet it includes five tools, knowledge assessment sheet, the radiation induced skin reaction assessment scale. Visual analogue pain scale, malnutrition screening tool, and instrumental activities of daily living. Results: the radiation therapy induced skin reaction (erythema, dry desquamation, moist desquamation, necrosis)were significantly decreased among the study group compared to those among the control group. The radiation induced skin reactions symptoms from the patients perspectives of the study group had significantly improved compared to the control group. Conclusions: Usage of Aloe Vera jel in combination of mild soap seemed to have a positive effect on reduction of radiation therapy induced skin reactions and its symptoms. Recommendations: Using aloe Vera gel as a topical agent in all patients' recieving radiation therapy. Developing strict written guidelines with colored pictures about prohibited, allowed skin care activities and substances for care during radiation therapy and instruction given to prevent or minimize the radiation therapy skin reactions. Educational program for patients and their families to inform them about possibility of prevention, how to recognize the radiation induced skin reactions.
Keywords : Using Aloe Vera Gel, Breast Cancer- Radiation Therapy

1. Introduction

Cancer is not only a disease but also a series of bad experiences that profoundly affect the both person who has the cancer and those who share the experience. Cancer is a collective term for many different diseases, each carrying a different prognosis and with a variety of consequences for the individuals concerned. It is a disease process that begins when abnormal cell is transformed by the genetic mutation of the cellular DNA. This abnormal cell forms a clone and begins to proliferate abnormally, ignoring growth-regulating signals in the environment surrounding it (Timpy & Smith, 2003).

Breast cancer is one of the most feared illnesses for women. It account for nearly one of every three cancers diagnosed. Carcinoma of the breast is the most prevalent cancer among Egyptian women and constitutes 29 % of National Cancer Institute cases and 33 % of all female cancers, the median age is 46 years and 60.5 % of patients are premenopausal (Omar et al., 2003; Abu-Bedair et al., 2003).

Worldwide, breast cancer is the fifth most common cause of cancer death after lung cancer, stomach cancer,

liver cancer, and colon cancer. In 2005, breast cancer caused 502,000 deaths that constitute 7 % of cancer deaths (WHO, 2006). Despite the overall decline in breast cancer mortality over the past decade, more than 40,000 deaths was attributed to the disease in 2007 alone between women in the United States Breast cancer. So the majority of women believe that risk for breast cancer is greater than their risk for any other type of illness, including heart disease (Nevidjon & Sowers, 2000).

Risk factors for breast cancer can be divided into those that cannot change and those that can change. Some factors that increase the risk of breast cancer that cannot alter include being a woman, getting older, having a family history (having a mother, sister, or daughter with breast cancer doubles the risk), having a previous history of breast cancer, having had radiation therapy to the chest region. Also getting periods young before 12 years old, having menopause late (after 50 years old), never having children or having them when are older than 30, and having a genetic mutation that increases the risk (Brenstein et al., 2003 & Ronckers, et al, 2005).

An invasive breast cancer is treated both in the immediate area of the cancer (locally) and through the whole body (systemically). The local treatment involves surgery and possibly radiation therapy. If systemic treatment is used, it involves hormonal therapy and/or chemotherapy. While many breast cancer cases seem similar, each woman should be evaluated and counseled on an individual basis. Using the information gained from imaging studies and biopsy results, the health care team will help guide patient towards the safest options for breast cancer care (James Cancer Hospital and Solove Research Institute, 2006).

Radiation therapy is a fundamental treatment modality for cancer. It is estimated that at least 60 % of patients being treated for cancer will receive radiation. The goal of radiotherapy is to precisely target a tumor volume with megavoltage x-rays while limiting the volume of normal tissue exposed to radiation. The intracellular target for these x-rays is deoxyribonucleic acid (DNA). Damage of the DNA can be sufficient to disrupt replication, resulting in cell death. In some cases, radiation therapy is the preferred and most effective treatment. In other cases, it is used in combination with chemotherapy or surgery (Hendry, et al, 2006).

One of the most common acute side effects of radiation therapy treatment is an acute skin reaction, sometimes referred to as radio-dermatitis. This is due to damage to the rapidly dividing cells in the basal layer of the epidermis (Stratum Basal). It is suggested that up to 95% of patients treated with external beam radiation therapy will develop some form of skin reaction. The reaction's presentation will be to some degree impact on the physiological, emotional and financial well-being of the patient, and can be significant enough to warrant cessation of the radiation treatment (Porock and Kristjanson, 1999; Kumar and Clark, 2005).

Acute skin reactions tend to occur more frequently in areas of increased moisture and friction, for example the axilla, inframammary fold and perineum. Discomfort and pain often accompany acute skin reactions; they may also become infected and are a major source of distress to patients Many patients suffer from acute radiation induced skin reactions, which develop after around two to three weeks of radiotherapy treatment and may persist for up to four weeks after the treatment has finished. The skin reaction can range from mild redness and dryness (similar to sunburn) to severe peeling (desquamation) of the skin in some patients. In some cases, the treated skin will remain slightly darker than it was before and it may continue to be more sensitive to sun exposure (El-Bolkainy, 2000; Kumar and Clark, 2005). The increased use of concomitant chemotherapy and high-dose radiation therapy means that skin reactions can still be a significant problem for patients Wells and Faithfull (2003).

Studies have evaluated aloe Vera gel as one of prophylactic agents for radiation-induced skin toxicity. Showed that there are several pharmacologically active compounds presented in the aloe Vera gel may help to decrease inflammation. One of these substances is a carboxypeptidase's, which can hydrolyze bradykinin and angiotensin I. Salicylic acid is also present and can be converted into a salicylate that will inhibit prostaglandin synthesis. The magnesium lactate in aloe Vera can inhibit histidine decarboxylase and act as an antihistamine. Aloe Vera has also been demonstrated to possess antibacterial and antifungal properties. Studies suggest using the aloe Vera gel in 98% in pure form (Felicia, Celia, and Ernane, 2002; Maddocks-Jennings, Wilkinson, and Shillington, 2005).

Nursing care of patients receiving surgery, radiotherapy, chemotherapy, or biologic therapy, alone and in combination, begins with physical and psychological preparation. The oncology nurse reviews the treatment plan with the oncologist, is aware of expected outcomes and possible complications, and independently assesses the patient's general physical and emotional status. The vital role of the oncology nurse is assessment of skin reactions, patient education regarding skin care, prevention, and managing skin breakdown if it occurs (Charles, Weaver, 2006).

2. Significance of the study:-

Skin care is a neglected area of nursing practice. Few research studieshas been done to guide practitioners on how best to manage skin problems and researches is needed to evaluate the effect of aloe Vera gel on incidence of skin reactions.

3. Aim of the study

The aim of the study is to identify the effectiveness of skin preparation by using aloe Vera gel on incidence of skin reactions among breast cancer patients undergoing radiation therapy.

4. Research Questions

Breast cancer Women who receive skin preparation by using aloe Vera gel exhibit a positive effect by prevention of radiation therapy induced skin reactions.

5. Subjects and Method

Design :- Quasi experimental research design was utilized.

Setting:- The current study was conducted at Radiation therapy unit, Oncology Department , Menoufyia University Hospital .

Subjects:- a convenience sample of 60 patients was assigned and divided alternatively into two equal groups, 30 patients for each group.

Study group (I) received skin preparation by using aloe Vera gel.

Control group (II) exposed to routine hospital care.

The study sample was selected according to the following criteria:

1- Patient treated with external beam radiation therapy of the breast for the first time (Cobalt 60)
2- Consciously, female adult patients diagnosed with breast cancer before starting of radiation therapy
3- Have no skin problems and Normal vital signs
4- Free from any history of other associated diseases such as diabetes or infection or autoimmune disease as systemic lupus erytheromatosis.

The sample were selected in a randomly manner for study and control group, the even number for the study group and the odd number for the control group according to ordinary starting the radiation therapy session date.

Variables:-The independent variable is the skin preparation by using aloe Vera gel, while the dependent variable is incidence of skin reactions among breast cancer patients undergoing radiation therapy.

Tools for data collection: -

Tool 1 : Radiation therapy, patients Knowledge stracturee interview schedule:

It was developed by the researcher after reviewing a related literature. A structured interview was used to asess breast cancer patient's knowledge regarding radiation therapy, its side effects, and skin care, it was in Arabic and comprised of three parts as the following:-

- Part one :Sociodemographic Data: It include data related to patient's sociodemographic data as name, age, sex, level of education, occupation, marital status & place of residence**.**
- Part two**:** Medical History:

*A. Medical History***;** data related to patient's past, present medical history, surgery, previous or current chemotherapy and family medical history. It also include questions related to duration of present disease, and mode of disease discovery.

B. Risk factors of the breast cancer; data related to patient's exposure to radiation, smoking, insectisieds, sports, stresses, and nutritional pattern.

- Part three **:** Patient's Knowledge about radiation therapy:

It include questions related to patient's knowledge regarding to radiation therapy definition, importance of radiation, side effects of radiation, as well as knowledge regarding skin reactions , and skin care.

Tool 2: Radiation Induced Skin Reaction Assessment Scale (RISRAS):- It developed by **Noble –Adams, (1999b)** and designed for weekly use for further assessment of the skin reactions ,the skin apperance and how the patient's actually feels from his point of view. It comprised of two parts as the following:-

- Part one: **patient symptoms scale:** It was composed of four questions. It recorded data about patient self assessment for symptoms of skin reactions such as itching, pain, each question was have four alternatives.
  1. A score of 1 denoted absence of symptoms.
  2. A score of 2 denoted slightly degree of symptoms.
  3. A score of 3 denoted moderate degree of symptoms.
  4. A score of 4 denoted very much symptoms.

Scoring system.

Patients were assessed, scores were calculated and scored as the following: A score of 1 : 4 denoted no skin reactions while a score of 5 : 8 indicated mild skin reactions, a score of 9 : 12 illusterated moderate skin reactions and a score of 13 : 16 denoted severe skin reactions.

- Part two: health care professional scale: It was used by the researcher to assess the skin reactions of the treated area, The assessment parameters included four items which scored as: -

1- Erythema:- scored from 0 to 4

Patients were assessed, scores were calculated and interpretad as the following : A score of (0) indicated normal skin,while a score of (1) illusterated dusky pink erythema, and a score of (2) denoted dull red erythema, moreover a score of (3) indicated brilliant red erythema, while a score of (4) indicated deep red purple.

2- Dry desquamation (DD): - A score ranged from 0 to 4.Patients skin was assessed and a score were interpreted as the following: A score of (0) indicated normal skin, a score of (1) illusterated <25% of total irradiated area affected with dry desquamation, a score of (2) indicated <25-50% of total irradiated area affected with dry desquamation, a score of (3) indicated >50-75% of total irradiated area affected with dry desquamation, while a score of (4) indicated >75-100% of total irradiated area affected with dry desquamation.

3- Moist desquamation:- scored from 0 to 6. Patients skin were assessed, a score was calculated andinterpreted as: A score of 0 indicated normal skin, a score of 1.5 illusterated <25% of total irradiated area affected with moist desquamation, a score of 3 indicated <25-50% of total irradiated area affected with moist desquamation, a score of 4.5indicated >50-75% of total irradiated area affected with moist desquamation, while a score of 6 indicated >75-100% of total irradiated area affected with moist desquamation.

4- Necrosis (N): - scored from 0 to 10. Patients skin were assessed, calculated and scored was interprated as: A score of 0 indicated normal skin, a score of 2.5 illusterated <25% of total irradiated area affected with necrosis, a score of 5 indicated <25-50% of total irradiated area affected with necrosis, a score of 7.5 indicated >50-75% of total irradiated area affected with necrosis, while a score of 10 indicated >75-100% of total irradiated area affected with necrosis.

Tool 3 : Visual analogue pain scale:

It provides a simple way to record subjective estimates of pain intensity. The measurments is from zero to ten to rate the patient's level of pain (**Bain et al., 2005).** The measurement parameters included four items. A score of 0 means no pain while a score of 1-3 denoted mild pain, a score of 4-6 indicated moderate pain and a score of 7-10 illusterated worst pain.

Tool 4 : Malnutrition screening tool:

It is developed by **Nutritional Research Group (FBBC), (1996)** to assess of the nutritional status of the patients . it used by the researcher to identify the nutritional risks for developing radiation therapy skin reactions. It include items as weight loss, changes in appetite. If scoring 3 or more the medical follow up is necessery.

Tool 5 : Instrumental Activities of Daily Living:

It is composed of 13 questions. It is developed by **Proctor et al. (2005)** and
used by researcher to assess how the skin reactions affects the daily living abilities of the patient, the maximum score 13.

Method

- Official approval: a written permission was obtained from the hospital director and the head of the unit.
- Validity; the tool was tested for content validity by 4 experts in the field of medical-surgical nurses and medical specialist that ascertained relevance and completeness &then the corrections were done accordingly.
- Reliability: to measure reliability of the tool a test–retest methods.
- Informed consent for participation was obtained after explanation of the goal of the study. Privacy and confidentiality was assured
- Pilot study: **-** A pilot study was conducted on six patients who were not included in the total sample. This was performed in order to test the clarity and the applicability of the tools. Necessary modifications were then done, data obtained was excluded from the study.
- Each interview was reassured that any information obtained would be confidential and only would be used for the study purpose.
- The researcher assessed each patient individually against items of the structure interview. It took about 20-25 minutes. Data was collected in five days of each week from Sunday to Thursday from 9.00 A.M. to 6.00 P.M. according to the attendance polices of the hospital. Data were collected over a period of 6 months from February 2007 to July 2007.
- Patients who fulfill the inclusion criteria were interviewed individually in Radiation therapy Unit at Clinical Oncology Department before starting the radiation therapy.
- Knowledge assessement obtained before the begining of the first radiation therapy session by using Knowledge assessement sheet for both group tool, to determine patients Knowledge.
- The study group (I) received skin preparation with 98% pure aloe Vera gel applied to the affected area twoice daily after each radiation therapy session throughout the period of therapy. Gel wash off with water and mild soap before the next radiation therapy session.
- Control group(II) was exposed to routine hospital care.
- Skin assessment was done by the researcher before the begining of the first radiation therapy session, and before every session of radiation therapy and two weeks after the last radiation therapy session by using the

Radiation –Induced Skin Reaction Assessment Scale (RISRAS) tool II for both group I and II.

- Pain assessment done before the begining of the first radiation therapy session, and before every session of radiation therapy and two week after the last radiation therapy session by using the visual analogue pain scale (**Bain et al., 2005)** for both group I and II.
- Assessment of daily living activities were done before begining of the first radiation therapy session, and before the session No.12 of radiation therapy and two weeks after the last radiation therapy session by using the instrumental activities of daily living (**Proctor et al., 2005)** for both group I and II (tool III)**.**

6. Statistical analysis

Results were statistically analyzed using statistical software package. Quantitative variables were presented in the form of mean (x) and standard deviation (SD) and tested by Student t-test which is a test of significance used for comparison between two groups having quantitative variables and Mann-Whitney test (nonparametric test) which is a test of significance used for comparison between two groups not normally distributed having quantitative variables.

Qualitative variables were used as Chi-square test (χ^2).

7. Results

Table 1 illustrated that, patients were age group between 40 to less than 50 years old represented the highest percentage among study and control group it represents 40.1%,46.7% respectively. Regarding to the level of education the illiterate was representing (46.7% & 36.7%) for both studied and control group respectively.

Table2 revealed that, mastectomy was the most common surgery among studied and control group (86.7%, 83.3%) respectively. In relation to the administration of chemotherapy and number of chemotherapy cycles, the all study group(100%) was taken chemotherapy before radiotherapy. Regarding to the number of chemotherapy cycles 90% of the study group and 96.7% of the control group was taken six cycles of chemotherapy. As regards to family history of the same disease (breast cancer) the results showed that approximately more than one third of the studied and control group (43.3%, 33.3%) respectively had family history of breast cancer. Referring to family member who had the breast cancer, 30 % of the study group has family history through mother and sister compared to 30% of the control group.

Table 3 revealed that, the entire studied sample (study and control group) had no history of radiation exposure. As well as the daily exposure to toxic substances as insecticides and smoking represented 40% for both study and control group. Highest percentage of both study and control group (73.3%, 80%) respectively exposed to stress.

Table 4 revealed that, the highest percentage of both study and control group having knowledge regarding to definition of radiation therapy (60% & 53.3%). and the importance of radiation therapy 73.3% & 66.7%. Referring to knowledge about the complications of radiation therapy 60% of both study and control group knew complications. The source of knowledge was the friends and other patients for both study and control group (43.3 %, 53.3 %) respectively.

Table 5 Showed that; more than half of the both study and control group (56.7%, 63.3%) respectively knew the meaning the definition of the radiation therapy skin reaction. On other hand The majority of both study and control group (96.7%, 83.3%) didn't use any substance for caring the skin during radiation therapy respectively, while the minority of both study and control group (3.3%, 16.7%) uses water only for caring the skin during radiation therapy.

Table 6 revealed that, 43.3% of the study group received radiation through linear accelerator machine and 40% received radiation through co^{60} machine. While 73.3% of the control group received radiation through linear accelerator machine and 23.4% received radiation through co^{60} machine.

Figure 1 showed that, 26.7% of the study group experienced no erythema, while 30 % experienced dusky pink erythema.

Figure 2 showed that, 53.3 % of the study group experienced no dry desquamation (normal skin), 40 % experienced <25 % of area affected with dry desquamation.

Figure 3 showed that, 96.7 % of the study group experienced no moist desquamation (normal skin), and 3.3 % experienced >50-75 % of area affected with moist desquamation, while 83.3 % of the control group experienced no moist desquamation (normal skin), 13.3 % experienced <25 % of area affected with moist desquamation.

Figure 4 showed that, 100 % of the study group experienced no necrosis, while 96.7 % of the control group experienced no necrosis, and 3.3 % experienced >50-75 % of area affected with necrosis.

Table 7 showed a statistically significant difference between the study and control group regarding to pain at 4^{th}, week and 2 weeks after the last radiation therapy session at P value (0.011, 0.000) respectively.

Table (8) revealed that statistically significant difference between degree of skin reaction and level of daily living activities at 2 weeks after the last radiation session among the study group at P value (0.051), whereas, the

results in the control group revealed that no statistically difference between degree of skin reaction and level of daily living activities.

Table 1: Distribution of patients according to Socio-demographic characteristics of the studied sample

Socio-demographic characteristics	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- Age (years)						
20-	1	03.3	2	06.7		
30-	7	23.3	8	26.7	1.55	0.670
40-	12	40.1	14	46.6		
50≤60	10	33.3	6	20.0		
X ± SD	44.5 ± 3.9		43.4 ± 4.2			
- Marital status						
Single	3	10.0	2	6.7		
Married	24	80.0	25	83.3	0.22	0.896
Widow	3	10.0	3	10.0		
-Residence						
Rural	24	80.0	23	76.7	0.10	0.754
Urban	6	20.0	7	23.3		
-Occupation						
House wife	23	76.7	23	76.7		
Worker	1	03.3	1	03.3	1.09	0.779
Employee	6	20.0	6	20.0		
-levels of education						
Illiterate	14	46.7	11	36.7		
Read and write	6	20.0	7	23.3		
Primary	0	00.0	2	06.7	2.66	0.617
Secondary	6	20.0	7	23.3		
University	4	13.3	3	10.0		

Table 2: percentage distribution of patients in relation to present and family medical history of both study and control group

Medical history	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- Present history of:						
A- Duration of disease (year)						
≤1 year	7	23.3	6	20.0		
1<2 year	17	56.7	18	60.0	1.20	0.754
≥2 year	6	20.0	6	20.0		
B- Types of Surgery						
Mastectomy	26	86.7	25	83.3		
Lumpectomy	4	13.3	4	13.3	1.02	0.601
None	0	00.0	1	03.4		
C- administration of chemotherapy						
Yes	30	100	29	96.7	1.02	0.313
No	0	0.00	1	03.3		
D-No. of chemotherapy Cycle						
3 cycle	3	10.0	0	0.00	3.06	0.080
6 cycle	27	90.0	29	96.7		
Family history of cancer						
Yes	13	43.3	10	33.3	0.6	0.426
No	17	56.7	20	66.7		
Family member who has cancer						
Mother	4	13.3	8	26.7		
Sister	5	16.7	1	03.3	6.05	0.109
Uncles and Ants	4	13.3	1	03.3		

Table 3 percentage of patients according to environmental risk factors for breast cancer of both study and control group

Risk factors	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
-Past history of Daily exposure to radiation						
Yes	0	0.0	0	0.0	--------	-------
No	30	100	30	100		
- Daily exposure to toxic substances						
Insecticides						
Smoking	8	26.7	10	33.3	0.44	0.81
Both	10	33.3	8	26.7		
	12	40.0	12	40.0		
- Physical activities						
Yes	0	0.0	0	0.0	--------	----------
No	30	100	30	100	---	
- Frequent exposure to stress						
Yes	22	73.3	24	80.0		
No	8	26.7	6	20.0	0.37	0.54
- Daily sleeping hours						
<6	5	16.7	1	03.3		
6-8	25	83.3	28	93.4	3.84	0.15
>8	0	00.0	1	03.3		
- Eating fiber diet					1.07	
Yes	14	46.7	18	60.0	1.07	0.301
No	16	53.3	12	40.0		
- Eating fatty diet						
Yes	7	23.3	14	46.7	3.59	0.06
No	23	76.7	16	53.3		
- Eating fruits						
Yes	15	50.0	12	40.0	0.61	0.44
No	15	50.0	18	60.0		
- Eating frozen food						
Yes	6	20.0	8	26.7	0.37	0.54
No	24	80.0	22	73.3		

Table 4: percentage distribution of Patient's regarding knowledge about radiation therapy among the study and control group

Patient's Knowledge	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- definition of Radiation therapy						
Yes	18	60.0	16	53.3		
No	12	40.0	14	46.7	0.27	0.602
If yes						
- Complete answer	12	40.0	8	26.6	3.79	0.151
- Incomplete	6	20.0	5	16.7		
- Wrong	0	00.0	3	10.0		
- Importance of radiotherapy						
Yes	22	73.3	20	66.7		
No	8	26.7	10	33.3	0.32	0.573
If yes						
Complete answer	15	50.0	17	56.7	1.63	0.201
Incomplete	7	23.3	3	10.0		
Wrong	0	00.0	0	00.0		
- No. of session						
Yes	30	100	29	96.7	1.02	0.313
No	0	00.0	1	03.3		
- Knowing complications						
Yes	18	60.0	18	60.0		
No	12	40.0	12	40.0	---------	---------
- Complications						
Skin	2	06.7	3	10.0	0.23	0.630
Fatigue, skin , loss of appetite	16	53.3	15	50.0		
- Source of knowledge						
Doctors	5	16.7	2	06.7		
Friends and other patients	13	43.3	16	53.3	1.60	0.206

Table (5) percentage distribution of Patient's regarding knowledge about radiation therapy skin reaction, and skin care among the study and control group

Patient's Knowledge	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- Radiation therapy skin reaction						
Know	17	56.7	19	63.3	0.28	0.598
Don't know	13	43.3	11	36.7		
- Substances used in skin care						
Nothing	29	96.7	25	83.3	2.96	0.085
Water	1	03.3	5	16.7		
- Clothes						
Cotton	27	90.0	28	93.3	0.22	0.640
Synthetic	3	10.0	2	06.7		
- No. of bath/ week						
None	19	63.3	21	70.0		
1	11	36.7	6	20.0	4.57	0.102
2	0	00.0	3	10.0		
-Persons who take care for patient						
Husband	2	06.7	2	06.7	10.89	0.055
Mother	0	00.0	3	10.0		
Kids	13	43.3	10	33.3		
Brother	0	00.0	1	03.3		
All of above	0	00.0	5	16.7		
None	15	50.0	9	30.0		

Table (6) percentage distribution of Patient's related to Types of radiation therapy used for both study group and control group

Radiation technique	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- Radiation type						
Linear accelerator	13	43.3	22	73.3	6.30	0.04*
Cobalt ^{60}	12	40.0	7	23.4		
Both	5	16.7	1	03.3		
- Radiation dose						
5000cGY	29	96.7	30	100	1.02	0.313
6000cGY	1	03.3	0	0.00		
-No. of sessions						
25	29	96.7	30	100	1.02	0.313
30	1	03.3	0	0.00		
-Continuity of radiation						
Continuous	28	93.3	22	73.3	4.32	0.03*
Intermittent	2	06.7	8	26.7		
-Dose/Fraction						
200cGY	30	100	30	100	--------	---------
- Use of bolus						
Yes	29	96.7	30	100	1.02	0.313
No	1	03.3	0	0.00		

* mean significant at P value = <0.05

Fig 1(32): Erythema after 2weeks from the last session

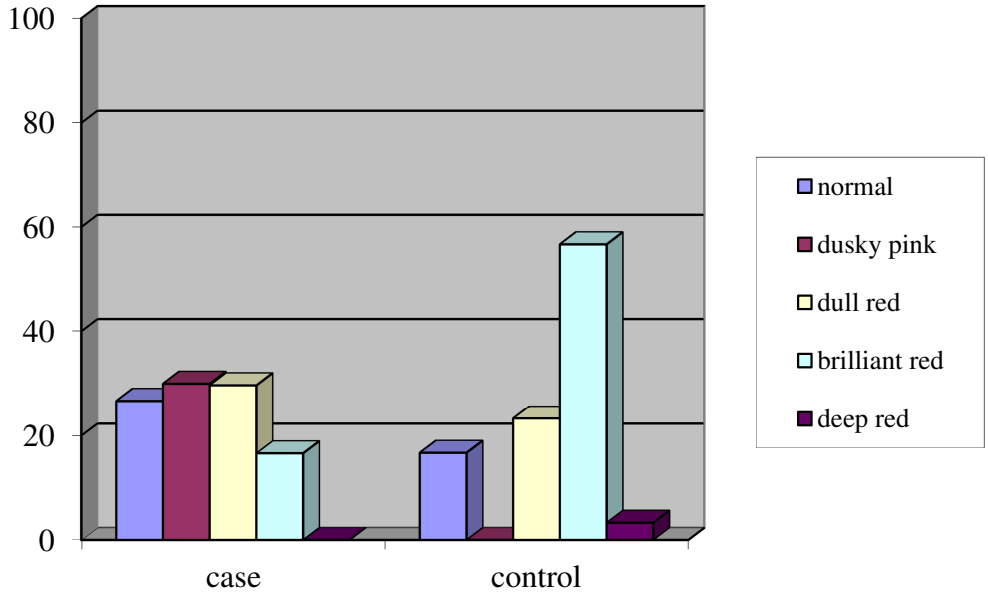

Fig 2. Dry desquamation after 2 weeks from the last session

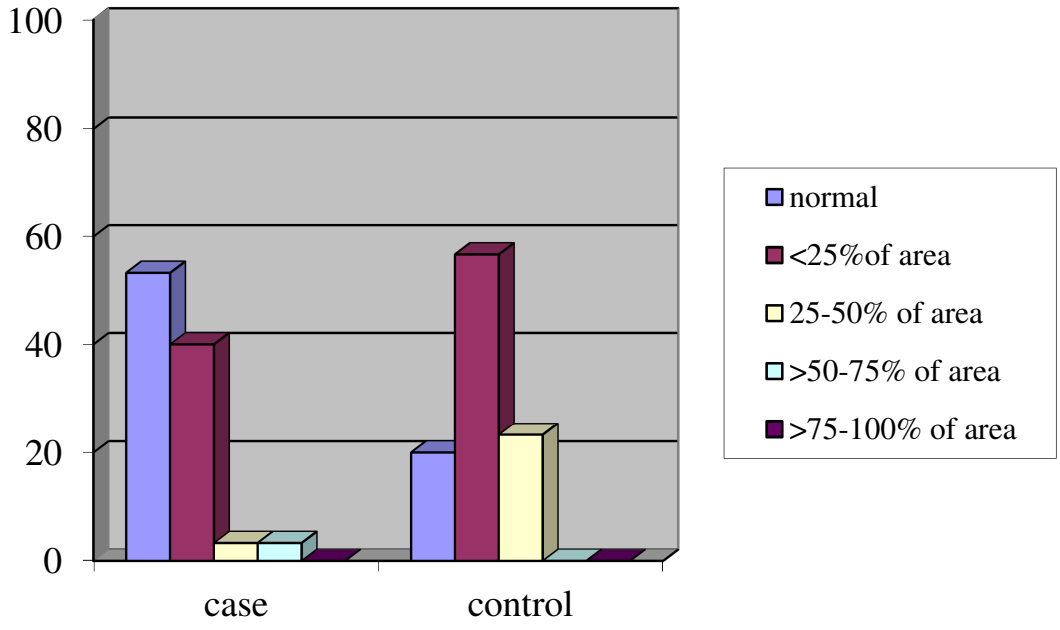

Figure 2 . Showed the incidence of dry desquamation at 2 weeks after the last session

Fig 3: Moist desquamation after 2 weeks from the last session

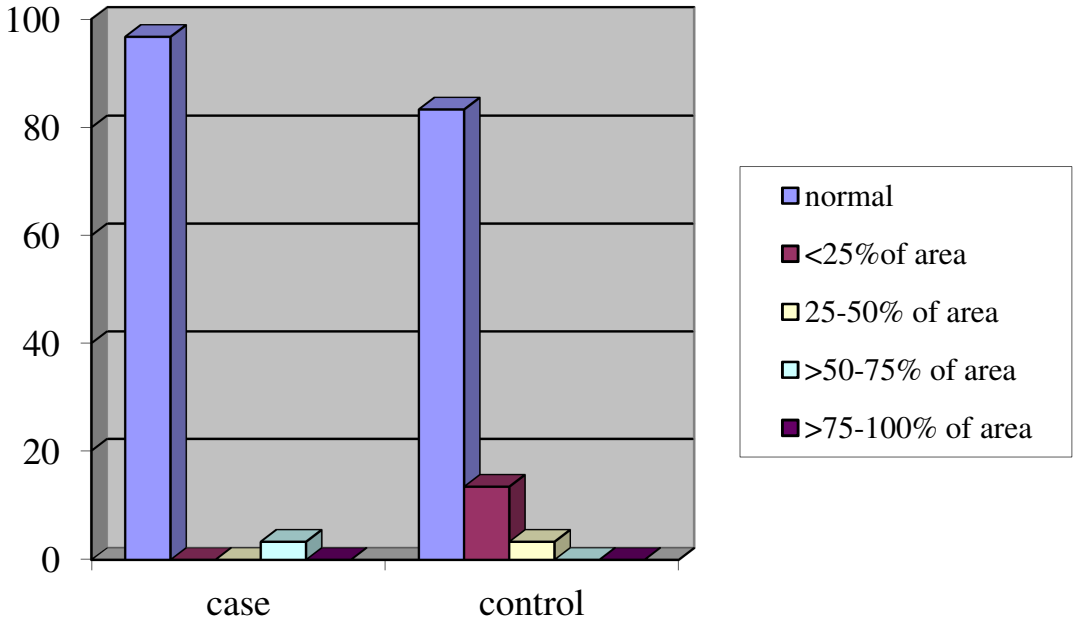

Fig 4 . Necrosis after 2 weeks from the last session

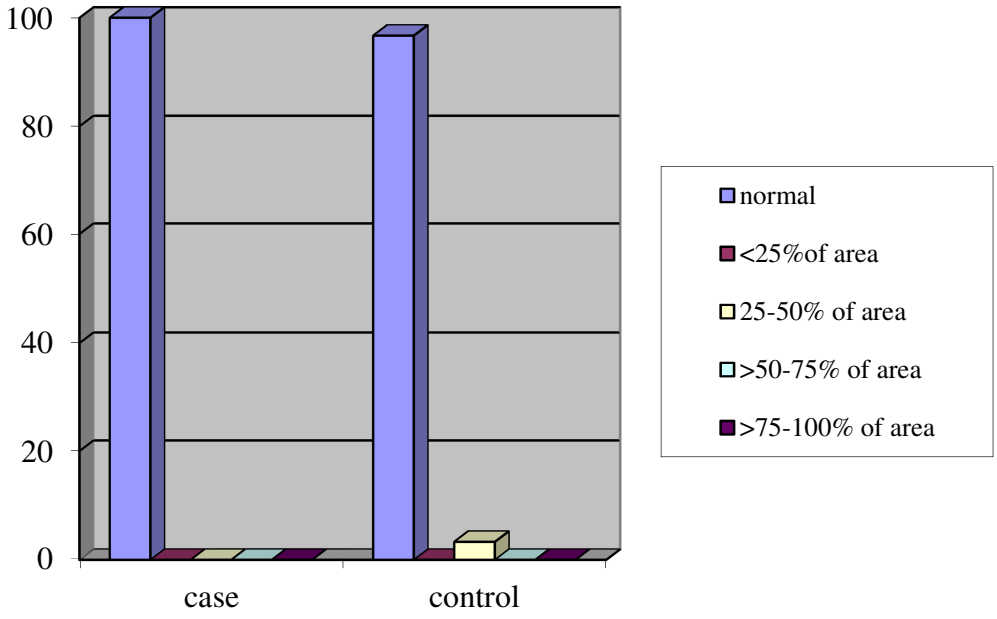

Table 7 . Distribution of Assessment of pain for the study and control group at different times of assessment

Pain Assessment	Study group (n=30)		Control group (n=30)		X^2	P
	No.	%	No.	%		
- 1st week						
No pain	30	100	30	100	---------	--------
- 2nd week						
No pain	30	100	29	96.7	1.02	0.313
Moderate	0	0.00	1	03.3		
-3rd week						
No pain	30	100	21	70.0	10.59	0.060
Moderate	0	0.00	4	14.3		
Severe	0	0.00	5	16.7		
-4th week						
No pain	24	80.0	14	46.7	16.63	0.011*
Moderate	4	14.3	8	43.3		
Severe	2	06.7	3	10.0		
-5th week						
No pain	22	73.3	12	40.0	14.05	0.081
Moderate	6	20.0	5	16.7		
Severe	2	06.7	13	43.3		
2 weeks after the last session						
No pain	9	30.0	4	13.3	30.46	0.000*
Moderate	16	53.3	2	06.7		
Severe	5	16.7	24	80.0		

* mean significant at P value = <0.05

Table (8): Relationship between radiations induced skin reaction and daily living activities between the study & the control group n =30

Skin reaction	Daily living activities study group			Sig.	P	Daily living activities control group			X^2	P
	No.	%	X±SD			No.	%	X±SD		
- At 3rd week										
No skin reaction	**29**	**96.7**	**11.90±1.9**	**t =**	**0.57**	**17**	**56.6**	**11.2±3.3**	**t=**	**0.69**
Mild skin reaction	**1**	**03.3**	**13.00±0.0**	**0.58**		**13**	**43.3**	**10.7±3.3**	**0.4**	
- At 2 weeks after the last radiation	**8**	**26.7**	**11.38±2.3**			**4**	**13.4**	**13.0±0.0**		
No skin reaction	**18**	**60.0**	**11.94±2.1**	**f =**	**.05***	**6**	**20.0**	**8.00±3.1**	**f =**	
Mild skin reaction	**3**	**10.0**	**9.67±3.06**	**2.96**		**14**	**46.6**	**10.5±2.**	**2.7**	**0.07**
Moderate skin reaction	**1**	**03.3**	**6.00±0.0**			**6**	**20.0**	**9.17±3.7**		
Severe skin reaction										

Discussion

Carcinoma of the breast is the most prevalent cancer among Egyptian women and constitutes 29% of National Cancer Institute cases. Median age at diagnosis is one decade younger than in countries of Europe and North America and most patients are premenopausal. Breast tumors among Egyptian women relatively advanced at presentation. The majority of tumors are invasive duct subtype and the profile of hormone receptors is positive for estrogen receptors and/or progesterone receptors in less than half of cases (Omar et al., 2003). Radiation therapy is a locally treatment modality may be used to destroy cancer cells remaining in the breast, chest wall, or under arm area after surgery, or to reduce the size of a tumor before surgery (Early Breast Cancer Trailist's Collaborative group, 2000). In this respect, the main concern of the present study was to the identify the effectiveness of skin preparation by using aloe Vera gel on incidence of skin reactions among breast cancer patients undergoing radiation therapy.

Regarding the age; the results of the present study indicated that near half of the study and control group were in the age group from 40 to less than 50 years old. The finding was consistent with the study done by Hamed

(2003) who stated that the age of the breast cancer patients in their study ranged from 40 years to less than 60 years with the mean age 46 years. This result also was in line with Galal and Gomaa (2006) have reported that age could not be considered a risk factor of breast cancer in their study. Therefore, attention should be give to this age group which will affect the patients and family and cause burden on them.

Concerning educational level, the results of the present study revealed that less than half of the study group and above one third of the control group were illiterate. This result is in agreement with that reported by Hamed (2003).

Regarding family history of breast cancer, the findings of the current study claimed at the family history for breast cancer especially closed first degree relative family history (mother, sister) linked to breast cancer risk. This is in consistent with the findings of many studies that have all reported increased risk of breast cancer among women with positive family history of breast cancer (Carpenter et al., 2003).

According to the current study findings concerning exposure to radiation, there was no statistically significant association regarding breast cancer risk. This result in contradiction with Gatti (2001) Carmichael, Sami and Dixon, (2003), who have reported the exposure to ionizing radiation are relevant in some populations to breast cancer risks especially in women who exposed to radiation from the time of puberty to the age of 30 years. The discrepancy might be related to the majority of the study and control group housewives.

The finding of the present study revealed the exposure to the insecticides, active or passive smoking, stress, and the level of physical activity have been shown linked to breast cancer risks. This is in agreement with the finding of Couch, Cerhan, and Vierkant (2001) reported that in women with strong family histories of breast/ovarian cancer, smokers were at 2.4 fold-increased risks for breast cancer relative to non-smokers. Moreover, Galal and Gomaa (2006) who demonstrated that high level of physical activity over the course of lifetime may lower breast cancer risk. Limited data are available on the role of stress in determining breast cancer risk. However, the results are against these results of Moradi et al., (2002) who claimed at no association was present between physical activity and breast cancer risk.

According to the current study findings concerning fatty diet, there was no statistically significant association regarding breast cancer risk. The result of the present study is in line with Cho et al., (2003) who have all reported a high fat diet is not directly related to the risk of breast cancer.

As regards the radiation induced skin reaction, the present study finding from the patient view of symptoms of skin reaction cleared that there was improvement of sensation of pain, inflammation, itching, and burning sensation among study group when comparing to control group. These results in congruence with the finding of Bosley, Smith, Baratti (2003) who clear patient-reported skin comfort in their study. The present findings contradicted with Heggie et al., (2002) who apply either 98% Aloe Vera gel or aqueous cream form of aloe Vera. Aqueous cream found was significantly better than aloe Vera gel in reducing pain, and itching. The discrepancy may relate to methodological limitations in their study including the possibility that the method of the patients blinding was inadequate, and none reporting of compliance.

The findings of the present study represented that incidence of radiation therapy skin reactions decreased among the study group with using aloe Vera gel in combination with mild soap rather than those among the control group who follow the routine care for health institution. This is in line with Richardson et al., (2005) who claimed that aloe Vera may reduce vasoconstriction, as well as leukocyte and platelet aggregation at an injured site. It may also improve tissue oxygenation, as well as increase the rate of collagen formation and reduce the amount of dead tissue at the radiation site. Additionally Richardson et al., (2005) reported that in their study, the aloe Vera participants experienced a significantly reduced incidence of moderate or more Erythema compared to others did not use aloe Vera gel. Moreover, Maddocks-Jennings, Wilkinson, Shillington (2005) have been demonstrated combination of aloe Vera gel and mild soap was superior to mild soap alone in preventing skin reactions in patients undergoing radiation therapy especially those receiving higher doses of radiotherapy. The main effect seemed to be the longer time it takes changes to occur and when they did occur they were less severe.

The most important factor in the development of radiation therapy induced skin reactions is radiation dose (Porock et al., 1998). In this respect the present study, radiation dose was almost identical in both group (study and control group) 5000cGY of radiation. Another factor is use of bolus during the radiation session, this material used to concentrate high dose of radiation to the particular area in the skin such as the scar. This material increase radiation induced skin reactions.

Aloe Vera gel was found to be significantly better than routine care in reducing itching, burning feeling, erythema, dry desquamation. It is likely that the moisturizing effects of aloe Vera reduced skin dryness and anti-inflammatory properties in aloe Vera that reduce the associated cracking and scaling of treated skin. This explanation supported by Richardson et al., (2005) have reported that moisturisation appear to be a key to early prevention of skin reactions and recommendations have including lanolin, barrier cream, aloe Vera and other hydrophilic substances. Other variables significantly affecting the development of skin side effects including

whether the patient had taken chemotherapy Kornmehl, 2007). In contradiction with the results were reported by Taher et al., (2004) who showed no correlation between the systemic treatment and the acute skin reaction, but reported that the effect of chemotherapy is more pronounced on late skin reaction. The current study findings cleared that the all study group and majority of the control group received chemotherapy before radiation therapy treatment. The skin reaction reduced in the study group who has used aloe Vera gel in combining with mild soap during radiation therapy treatment. These results in line with Heggie et al., (2002) have reported that the aloe Vera subjects experienced a significantly reduced incidence of moderate or more erythema compared with the aqueous group subjects for non-chemotherapy patients.

Patients consider the washing of the irradiated skin as important for their well-being. In this respect, the results of the current study cleared that the washing with water and un-perfumed mild soap did not increase the severity of skin reactions. This is consistence with Roy, Fortin, Larochelle (2001) have demonstrated that using of soap and water on the treatment field during radiation therapy is a safe procedure. Washing the irradiated skin during the course of radiotherapy for breast cancer is not associated with increased skin toxicity and should not be discourage. This discrepancy may be explore the reason, washing could play a preventive role in reducing the incidence of moist desquamation by decreasing bacterial and fungal overgrowth, which increases the inflammatory response and damage to basal cells. Since erythema reflects an inflammatory response, washing could then also limit erythema, leading to an overall lower toxicity score.

The current study results revealed that there was significant correlation between the incidence of skin reaction and daily living activities among study group at 2 weeks after the completion of radiation sessions. While there was no significant relation between skin reaction and daily living activities among control group. This is in consistence with the results of Faithfull & Wells (2003) has been reported that the skin changes resulted in functional and body image changes. Skin damaged limited household activities, the discomfort restricted what clothes could be worn, sleep disturbances were reported. While there was no significant relation between skin reaction and daily living activities among control grouping of the current study. This may be related to the stoppage of radiation therapy among control group who experiences skin reaction until improve the skin condition to complete radiation sessions.

8. Conclusion

Breast cancer patients received radiation therapy who use the aloe Vera gel in combination of mild soap seemed to have a positive effect on reduction of radiation therapy skin reaction as well as the radiation therapy induced skin reaction symptoms than those breast cancer patients received radiation therapy follow the routine care for radiation therapy department.

9. Recommendations

- Using aloe Vera gel as a topical agent in all patients recieving radiation therapy & Disseminated the current study findings to the pharmacological industries to suggest add aloe to soap and use it in caring for the irradiated skin in the medical field.
- Developing strict written guidelines with colored pictures about prohibited, allowed skin care activities and substances for care during radiation therapy.
- Developing a structured educational program for technicians, patients and their families to inform about possibility of prevention, how to recognize the radiation induced skin reactions.

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